

## General

### Title

Diagnosis and treatment of chest pain and acute coronary syndrome (ACS): percentage of patients with AMI who are referred to an appropriate cardiac rehabilitation program post-discharge.

### Source(s)

Davis T, Bluhm J, Burke R, Iqbal Q, Kim K, Kokoszka M, Larson T, Puppala V, Setterlund L, Vuong K, Zwank M. Diagnosis and treatment of chest pain and acute coronary syndrome (ACS). Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Nov. 91 p. [159 references]

## Measure Domain

### Primary Measure Domain

Clinical Quality Measures: Process

### Secondary Measure Domain

Does not apply to this measure

## Brief Abstract

### Description

This measure is used to assess the percentage of patients age 18 years and older with acute myocardial infarction (AMI) who are referred to an appropriate cardiac rehabilitation program post-discharge - Phase Two Programs: electrocardiogram-monitored, outpatient, and Phase Three Programs: non-monitored, outpatient.

### Rationale

The priority aim addressed by this measure is to increase the percentage of patients with acute myocardial infarction (AMI) using cardiac rehabilitation.

Studies by the National Heart, Lung, and Blood Institute estimate that each year approximately 785,000 Americans will have a new coronary attack and approximately 470,000 will have a recurrent attack.

Outpatient cardiac rehabilitation/secondary prevention programs are recommended for patients diagnosed with ST-elevation or non-ST-elevation myocardial infarction. Of particular concern are those patients who carry a moderate or high risk or have multiple modifiable risk factors for coronary artery disease and for whom supervised exercise training is deemed appropriate. There is strong evidence to suggest that cardiac rehabilitation programs have been shown to decrease mortality rates in all populations, including younger, more selective populations, as well as the socioeconomically and clinically diverse older population (age 65 and older).

#### Phase Two Cardiac Rehabilitation

The U.S. Public Health Service described Phase Two cardiac rehabilitation as a "comprehensive, long-term program including medical evaluation, prescribed exercise, cardiac risk factor modification, education and counseling. Phase Two refers to outpatient, medically supervised programs that are typically initiated one to three weeks after hospital discharge and provide appropriate electrocardiographic monitoring." In the past, the main emphasis was exercise based, but today the focus includes risk factor modification, education and counseling.

Research shows that a cardiac rehabilitation program based on regular exercise and education focused on risk factor reduction is both efficient and effective in altering the course of coronary heart disease. The initial outpatient phase includes a comprehensive evaluation, education and treatment for outpatients who have experienced a cardiac-related event. Phase Two patients are monitored with continuous electrocardiogram, blood pressure, heart rate and subjective Rating of Perceived Exertion. For certain patients, referral to a Phase Two program may facilitate earlier hospital discharge by providing emotional support in the outpatient hospital setting.

#### Phase Three Cardiac Rehabilitation

Phase Three is a maintenance program based on the continuation of a heart healthy lifestyle. The program is designed for patients who have completed a Phase Two cardiac rehabilitation program or for individuals with a cardiac history or significant cardiac risk factors. Patients are not continually monitored by electrocardiogram, but spot-check electrocardiograms and daily blood pressures and heart rates are often recorded. Trained staff, when available, continues to provide support and education for risk factor modification and exercise progression. Warm-up, aerobic exercise, stretching and strength training (when appropriate) are included in Phase Three.

## Evidence for Rationale

Ades PA. Cardiac rehabilitation and secondary prevention of coronary heart disease. N Engl J Med. 2001 Sep 20;345(12):892-902. [109 references] [PubMed](#)

Davis T, Bluhm J, Burke R, Iqbal Q, Kim K, Kokoszka M, Larson T, Puppala V, Setterlund L, Vuong K, Zwank M. Diagnosis and treatment of chest pain and acute coronary syndrome (ACS). Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Nov. 91 p. [159 references]

Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G, Ferguson TB, Ford E, Furie K, Gillespie C, Go A, Greenlund K, Haase N, Hailpern S, Ho PM, Howard V, Kissela B, Kittner S, Lackland D, Lisabeth L, Marelli A, McDermott MM, Meigs J, Mozaffarian D, Mussolino M, Nichol G, Roger VL, Rosamond W, Sacco R, Sorlie P, Roger VL, Thom T, Wasserthiel-Smoller S, Wong ND, Wylie-Rosett J, American Heart Association Statistics Committee and Stroke Statistics Writing Group Members. Heart disease and stroke statistics--2010 update: a report from the American Heart Association. Circulation. 2010 Feb 23;121(7):e46-e215. [PubMed](#)

Suaya JA, Stason WB, Ades PA, Normand SL, Shepard DS. Cardiac rehabilitation and survival in older coronary patients. J Am Coll Cardiol. 2009 Jun 30;54(1):25-33. [PubMed](#)

## Primary Health Components

Acute myocardial infarction (AMI); cardiac rehabilitation

## Denominator Description

Number of patients with acute myocardial infarction (AMI) discharged alive (see the related "Denominator Inclusions/Exclusions" field)

## Numerator Description

Number of patients with acute myocardial infarction (AMI) who are referred to an appropriate cardiac rehabilitation program post-discharge – Phase Two Programs: electrocardiogram-monitored, outpatient, and Phase Three Programs: non-monitored, outpatient (see the related "Numerator Inclusions/Exclusions" field)

## Evidence Supporting the Measure

### Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

### Additional Information Supporting Need for the Measure

- With recent evidence-based changes in both interventional percutaneous coronary intervention (PCI) and pharmacological interventions in patients with acute coronary syndromes (ACS), the Global Registry of Acute Coronary Events (GRACE) found that in the United States, adhering to these new changes, rates of in-hospital death, cardiogenic shock, and new myocardial infarctions in patients with non-elevation myocardial infarction (non-STEMI) events have significantly decreased. Similarly, in the STEMI population there has been a significant decrease in rates of in-hospital death, cardiogenic shock, heart failure and pulmonary edema.
- The National Quality Improvement Initiative found that the guidelines and treatments recommended by the American College of Cardiology/American Heart Association (ACC/AHA) were only followed 74% of the time in 350 of the U.S. hospitals it studied. Not adhering to the ACC/AHA guidelines for recommended care of patients with ACS/NSTEMI has been associated with increased in-hospital mortality.

### Evidence for Additional Information Supporting Need for the Measure

Davis T, Bluhm J, Burke R, Iqbal Q, Kim K, Kokoszka M, Larson T, Puppala V, Setterlund L, Vuong K, Zwank M. Diagnosis and treatment of chest pain and acute coronary syndrome (ACS). Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Nov. 91 p. [159 references]

Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G, Ferguson TB, Ford E, Furie K, Gillespie C, Go A, Greenlund K, Haase N, Hailpern S, Ho PM, Howard V, Kissela B, Kittner S, Lackland D, Lisabeth L, Marelli A, McDermott MM, Meigs J, Mozaffarian D, Mussolino M, Nichol G, Roger VL, Rosamond W, Sacco R, Sorlie P, Roger VL, Thom T, Wasserthiel-Smoller S, Wong ND, Wylie-Rosett J, American Heart Association Statistics Committee and Stroke Statistics, Writing Group Members. Heart disease and stroke statistics--2010 update: a report from the American Heart Association. *Circulation*. 2010 Feb 23;121(7):e46-e215. [PubMed](#)

## Extent of Measure Testing

Unspecified

## State of Use of the Measure

### State of Use

Current routine use

### Current Use

not defined yet

## Application of the Measure in its Current Use

### Measurement Setting

Ambulatory/Office-based Care

Hospital Inpatient

Hospital Outpatient

Rehabilitation Centers

### Professionals Involved in Delivery of Health Services

not defined yet

### Least Aggregated Level of Services Delivery Addressed

Clinical Practice or Public Health Sites

### Statement of Acceptable Minimum Sample Size

Unspecified

### Target Population Age

Age greater than or equal to 18 years

### Target Population Gender

Either male or female

## National Strategy for Quality Improvement in Health

# Care

## National Quality Strategy Aim

Better Care

## National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

## Institute of Medicine (IOM) National Health Care Quality Report Categories

### IOM Care Need

Getting Better

### IOM Domain

Effectiveness

## Data Collection for the Measure

### Case Finding Period

The time frame pertaining to the data collection is monthly.

### Denominator Sampling Frame

Patients associated with provider

### Denominator (Index) Event or Characteristic

Clinical Condition

Institutionalization

Patient/Individual (Consumer) Characteristic

### Denominator Time Window

not defined yet

### Denominator Inclusions/Exclusions

Inclusions

Number of patients with acute myocardial infarction (AMI) discharged alive

Population Definition: Patients 18 years and older.

Data Collection: This measure will involve chart review for appropriateness of referral.

Exclusions

Unspecified

## Exclusions/Exceptions

not defined yet

## Numerator Inclusions/Exclusions

Inclusions

Number of patients with acute myocardial infarction (AMI) who are referred to an appropriate cardiac rehabilitation\* program post-discharge – Phase Two Programs: electrocardiogram-monitored, outpatient, and Phase Three Programs: non-monitored, outpatient

\*Refer to the National Guideline Clearinghouse (NGC) summary of the Institute for Clinical Systems Improvement (ICSI) guideline [Diagnosis and Treatment of Chest Pain and Acute Coronary Syndrome \(ACS\)](#) .

Exclusions

Unspecified

## Numerator Search Strategy

Institutionalization

## Data Source

Electronic health/medical record

## Type of Health State

Does not apply to this measure

## Instruments Used and/or Associated with the Measure

Unspecified

## Computation of the Measure

## Measure Specifies Disaggregation

Does not apply to this measure

## Scoring

Rate/Proportion

## Interpretation of Score

Desired value is a higher score

## Allowance for Patient or Population Factors

not defined yet

## Standard of Comparison

not defined yet

## Identifying Information

### Original Title

Percentage of patients with AMI who are referred to an appropriate cardiac rehabilitation post-discharge – Phase Two Programs: electrocardiogram-monitored, outpatient, and Phase Three Programs: non-monitored, outpatient.

### Measure Collection Name

Diagnosis and Treatment of Chest Pain and Acute Coronary Syndrome (ACS)

### Submitter

Institute for Clinical Systems Improvement - Nonprofit Organization

### Developer

Institute for Clinical Systems Improvement - Nonprofit Organization

### Funding Source(s)

The Institute for Clinical Systems Improvement's (ICSI's) work is funded by the annual dues of the member medical groups and five sponsoring health plans in Minnesota and Wisconsin.

### Composition of the Group that Developed the Measure

*Work Group Members:* Thomas Davis, MD (*Work Group Leader*) (Park Nicollet Health Services) (Cardiology); Qamar Iqbal, MD (HealthEast Care System) (Internal Medicine); V. Krishna Puppala, MD, MPH (HealthEast Care System) (Internal Medicine); Rynn Burke, MD (HealthPartners Medical Group and Regions Hospital) (Internal Medicine and Hospitalist); Kara Kim, MD (HealthPartners Medical Group and Regions Hospital) (Hospitalist); Khuong Vuong, MD (HealthPartners Medical Group and Regions Hospital) (Hospitalist); Michael Zwank, MD (HealthPartners Medical Group and Regions Hospital) (Emergency Medicine); Tonja Larson, PharmD, BCPS (Marshfield Clinic) (Pharmacy); Marek Kokoszka, MD (Park Nicollet Health Services) (Cardiology); Linda Setterlund, MA, CPHQ (Institute for Clinical Systems Improvement) (Clinical Systems Improvement Facilitator); Jim Bluhm, MPH (Institute for Clinical Systems Improvement) (Team Director)

## Financial Disclosures/Other Potential Conflicts of Interest

The Institute for Clinical Systems Improvement (ICSI) has long had a policy of transparency in declaring potential conflicting and competing interests of all individuals who participate in the development, revision and approval of ICSI guidelines and protocols.

In 2010, the ICSI Conflict of Interest Review Committee was established by the Board of Directors to review all disclosures and make recommendations to the board when steps should be taken to mitigate potential conflicts of interest, including recommendations regarding removal of work group members. This committee has adopted the Institute of Medicine Conflict of Interest standards as outlined in the report Clinical Practice Guidelines We Can Trust (2011).

Where there are work group members with identified potential conflicts, these are disclosed and discussed at the initial work group meeting. These members are expected to recuse themselves from related discussions or authorship of related recommendations, as directed by the Conflict of Interest committee or requested by the work group.

The complete ICSI policy regarding Conflicts of Interest is available at the [ICSI Web site](#)

### Disclosure of Potential Conflicts of Interest

Rynn Burke, MD, Work Group Member

Internal Medicine Physician, HealthPartners Medical Group and Regions Hospital

National, Regional, Local Committee Affiliations: None

Guideline Related Activities: MN Department of Health Pandemic Planning

Research Grants: None

Financial/Non-Financial Conflicts of Interest: None

Thomas Davis, MD, Work Group Leader

Cardiologist, Park Nicollet Health Services

National, Regional, Local Committee Affiliations: None

Guideline Related Activities: None

Research Grants: None

Financial/Non-Financial Conflicts of Interest: None

Qamar Iqbal, MD, Work Group Member

Internal Medicine Physician, HealthEast Care System

National, Regional, Local Committee Affiliations: None

Guideline Related Activities: None

Research Grants: None

Financial/Non-Financial Conflicts of Interest: None

Kara S. Kim, MD, Work Group Member

Emergency Medicine, HealthPartners Regions Hospital

National, Regional, Local Committee Affiliations: None

Guideline Related Activities: None

Research Grants: None

Financial/Non-Financial Conflicts of Interest: None

Marek J. Kokoszka, MD, Work Group Member

Cardiologist, Park Nicollet Health Services

National, Regional, Local Committee Affiliations: None

Guideline Related Activities: None

Research Grants: None

Financial/Non-Financial Conflicts of Interest: None

Tonja Larson, PharmD, BCPS, Work Group Member



Pharmacist, Marshfield Clinic  
National, Regional, Local Committee Affiliations: None  
Guideline Related Activities: None  
Research Grants: None  
Financial/Non-Financial Conflicts of Interest: None

Krishna Puppala, MD, Work Group Member  
Internal Medicine and Hospitalist, HealthEast Care System  
National, Regional, Local Committee Affiliations: None  
Guideline Related Activities: None  
Research Grants: None  
Financial/Non-Financial Conflicts of Interest: Consulting for services provided as hospitalist practice.

Khuong M. Vuong, MD, Work Group Member  
Hospitalist, HealthPartners Medical Group and Regions Hospital  
National, Regional, Local Committee Affiliations: None  
Guideline Related Activities: None  
Research Grants: None  
Financial/Non-Financial Conflicts of Interest: None

Michael D. Zwank, MD, Work Group Member  
Emergency Medicine, HealthPartners Regions Hospital  
National, Regional, Local Committee Affiliations: None  
Guideline Related Activities: None  
Research Grants: None  
Financial/Non-Financial Conflicts of Interest: None

## Adaptation

This measure was not adapted from another source.

## Date of Most Current Version in NQMC

2012 Nov

## Measure Maintenance

Scientific documents are revised every 12 to 24 months as indicated by changes in clinical practice and literature.

## Date of Next Anticipated Revision

The next scheduled revision will occur within 24 months.

## Measure Status

This is the current release of the measure.

This measure updates a previous version: Institute for Clinical Systems Improvement (ICSI). Diagnosis and treatment of chest pain and acute coronary syndrome (ACS). Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2011 Nov. 85 p. [151 references]

The measure developer reaffirmed the currency of this measure in January 2016.

## Measure Availability

Source available from the [Institute for Clinical Systems Improvement \(ICSI\) Web site](#)

For more information, contact ICSI at 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; Phone: 952-814-7060; Fax: 952-858-9675; Web site: [www.icsi.org](http://www.icsi.org) ; E-mail: [icsi.info@icsi.org](mailto:icsi.info@icsi.org).

## NQMC Status

This NQMC summary was completed by ECRI Institute on September 8, 2011.

This NQMC summary was updated by ECRI Institute on October 8, 2012 and again on April 12, 2013.

The information was reaffirmed by the measure developer on January 13, 2016.

## Copyright Statement

This NQMC summary (abstracted Institute for Clinical Systems Improvement [ICSI] Measure) is based on the original measure, which is subject to the measure developer's copyright restrictions.

The abstracted ICSI Measures contained in this Web site may be downloaded by any individual or organization. If the abstracted ICSI Measures are downloaded by an individual, the individual may not distribute copies to third parties.

If the abstracted ICSI Measures are downloaded by an organization, copies may be distributed to the organization's employees but may not be distributed outside of the organization without the prior written consent of the Institute for Clinical Systems Improvement, Inc.

All other copyright rights in the abstracted ICSI Measures are reserved by the Institute for Clinical Systems Improvement, Inc. The Institute for Clinical Systems Improvement, Inc. assumes no liability for any adaptations or revisions or modifications made to the abstracts of the ICSI Measures.

## Production

### Source(s)

Davis T, Bluhm J, Burke R, Iqbal Q, Kim K, Kokoszka M, Larson T, Puppala V, Setterlund L, Vuong K, Zwank M. Diagnosis and treatment of chest pain and acute coronary syndrome (ACS). Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2012 Nov. 91 p. [159 references]

## Disclaimer

### NQMC Disclaimer

The National Quality Measures Clearinghouse® (NQMC) does not develop, produce, approve, or endorse the measures represented on this site.

All measures summarized by NQMC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public and private organizations, other government agencies, health care organizations or plans, individuals, and similar entities.

Measures represented on the NQMC Web site are submitted by measure developers, and are screened solely to determine that they meet the [NQMC Inclusion Criteria](#).

NQMC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or its reliability and/or validity of the quality measures and related materials represented on this site. Moreover, the views and opinions of developers or authors of measures represented on this site do not necessarily state or reflect those of NQMC, AHRQ, or its contractor, ECRI Institute, and inclusion or hosting of measures in NQMC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding measure content are directed to contact the measure developer.